LIBRARY
STATE PLANT BOARD
MAR 4 - '40

UNITED STATES
DEPARTMENT OF AGRICULTURE

BUREAU OF
ENTOMOLOGY AND PLANT QUARANTINE
NEWS LETTER

VOLUME VII 3

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR JANUARY 1940

Vol. VII, No. 3 (Not for publication) March 1, 1940

VERN O. TAYLOR

Vern O. Taylor, associate pathologist, and Bureau representative in charge of barberry eradication in Wisconsin, died at University Hospital in Madison, Wis., on February 2, following an illness of short duration. He is survived by his wife, Mrs. Helen J. Taylor, a daughter Marion, and a son Vern.

Mr. Taylor was born March 4, 1903, at Manawa, Wis. After attending the Oshkosh High School he enrolled at the University of Wisconsin and in June 1930 received the degree of Bachelor of Science. Following graduation he accepted a position in the milling industry with headquarters at St. Louis, Mo., where he remained until receiving an appointment on January 15, 1931, as State leader of barberry eradication, with headquarters at Madison, Wis. He served the Bureau in this capacity until the time of his death.

His death represents a distinct loss to the Bureau and the community. He was an enthusiastic worker and enjoyed a wide acquaintance throughout Wisconsin and neighboring States.

He was a member of Delta Theta Sigma.

BUREAU APPROPRIATIONS

The bill to provide appropriations for the Department for the fiscal year 1941 passed the House and is now awaiting consideration by the Senate. As it passed the House it provides $5,644,301 for the Bureau, which is $829,184 below the budget estimates of working funds. The budget estimates for all supply bills included small amounts under each item for administrative promotions. These amounts have been eliminated from all of the supply bills so far considered by the House. The budget estimates for the fiscal year 1941 provided the following increases and decreases in amounts of the appropriations for working funds for the current fiscal year:

Increases

Mexican fruitfly control	$15,000
White pine blister rust control	100,000
A new item for the control of white-fringed beetle	600,000

Decreases

Fruit insects	$15,916
Sweetpotato weevil control	5,000
Forest insects (Work on azalea blight to be discontinued)	400
Truck crop and garden insects	15,000
Cereal and forage insects	16,700
European corn borer control	5,000
Pink bollworm control	382,808

The bill as it passed the House provides for reductions below the budget estimates for the following:

Mexican fruitfly control	$15,000
Dutch elm disease eradication	100,000
Forest insects	52,700
Barberry eradication	50,000
Insects affecting man and animals	31,500
Insecticide and fungicide investigations	9,981

It eliminates the new item for white-fringed beetle control and increases the item for control investigations by $5,000 for investigations on methyl bromide.

Under date of January 27 the President submitted an estimate of $3,000,000 under the general authorization for the control of incipient and emergency outbreaks of insect pests and plant diseases, for possible inclusion in the Deficiency Bill. This estimate has not yet been reported from the House Committee.

"MEDICAL FACILITIES"

Under date of September 1, 1939, the United States Employees' Compensation Commission was supplied with a mailing list of employees of this Bureau, revised to that date, to receive copies of pamphlet CA 76, "Medical Facilities," together with monthly supplements of changes in designated physicians and hospitals. Additional copies of this circular and supplements may be obtained upon application of the Commission through the Office of the Business Manager. The Commission is now distributing a revised edition of their Regulations in pamphlet form, effective June 1, 1938, as amended to June 30, 1939. This publication is being supplied to all Bureau employees whose duties necessitate reference to the Regulations in carrying out the provisions of the Compensation Act of September 7, 1916. Additional copies of this booklet may be had on application to the Office of the Business Manager.

FRUIT INSECT INVESTIGATIONS

Moth trapping in vineyards.--Dwight F. Barnes and George H. Kaloostian, of the Fresno, Calif., laboratory, completed on November 14 a record of the seasonal fluctuations in abundance of 5 species of moths in 7 vineyards in Fresno and Tulare Counties. The work was begun April 1, 1939. Collections from 21 malt-sirup bait traps, 3 in each location, were made at intervals of 3 and 4 days, and new bait was put out on each collection date. The following tabulation gives a summary of some of the data. In addition, a single specimen of the Mediterranean flour moth (Ephestia kuehniella Zell.) was taken.

Species	Total moths	Total females	Gravid females
	Number	Percent	Percent
Ephestia figulilella Greg------	13,162	51	89
Ephestia elutella (Hbn.)-------	69	91	65
Plodia interpunctella (Hbn.)--	22	32	71
Desmia funeralis (Hbn.)--------	5,813	54	94
Ephestiodes nigrella Hulst-----	1,188	87	73

Effects of low temperatures on San Jose scale in Georgia.--Oliver I. Snapp reports that San Jose scale crawlers under gravid female scales were killed by a minimum temperature of 18° F. above zero on January 3 at Fort Valley, Ga. Experiments conducted at the Fort Valley laboratory showed that a minimum temperature of 16° above zero will not kill mature San Jose scales nor immature stages of this insect after the covering begins to form. Some mortality of these immature stages and the mature scales on peach trees was recorded at 12° abvoe zero, the percentage of mortality increasing at temperatures below that point.

MEXICAN FRUITFLY CONTROL

Conditions in the lower Rio Grande Valley.--Extremely cold weather for this area between January 18 and 24 severely damaged the present citrus crop. The temperature dropped to below freezing for at least short intervals daily throughout this period, and on the 23d a low reading of 21° F. was recorded at Weslaco. Estimates of the loss range from 15 to 90 percent in individual groves. Groves having had poor care suffered most. Defoliation was severe in young plantings and in older unthrifty trees. Fruit harvested immediately after the freeze arrived in the markets in good condition and the canneries were able to process a large quantity. Adults of Anastrepha ludens Loew were trapped in every district. Flies were taken after the cold weather in sufficient numbers to indicate that part of them had survived the cold weather. Throughout the month 247 adults were submitted for identification. Inspections to discover infested fruit resulted in the finding of one grapefruit which contained 1 larva of A. ludens. This is the first record of infested fruit having been found in January in the regulated areas.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Hessian fly resistance in wheat.--E. T. Jones, Manhattan, Kans., reports that in a fall test for fly resistance at Springfield, Mo., involving 56 strains of ordinary winter wheat and approximately 100 selections of Marquillo-winter wheat hybrids, 40 percent of the selections were less than 10-percent infested. Infestation in most of the winter wheats ranged from 70 to 100 percent. In another test series, involving 810 varieties and selections, principally of spring wheat, 113 strains were found to possess a fair degree of resistance. All of these had less than 50 percent of the plants infested. Thirty-four rows of checks consisting of the susceptible variety Ceres, occurring at 25-row intervals throughout the series, averaged approximately 100-percent infestation. Some selections of Triumfo, Marvel, Ivy Gelou, IVCl ÷ #, and Illinois No. 1 W38 had no infestation. The selection Centenario had only 2 percent of the plants infested. These selections have exhibited resistance at Springfield over a period of several years.

JAPANESE BEETLE CONTROL

Indexing plants that withstand methyl bromide fumigation.--Preparatory to the listing of plants that successfully withstand methyl bromide fumigation and those that are injured by the gas, the treating section of the Division is indexing on cards all varieties of plants thus far fumigated, listing them according to quantity, date, temperature, size, whether potted, bare-rooted, or balled and burlapped, as well as the establishment at which fumigated. From these cards there will be made up an alphabetical list of plants for checking with nurserymen and with available information from other sources. There are now over 2,000 varieties indexed, under 236 genera. Before the list is compiled there will probably be nearly 3,000 varieties. There are very few reports of injury to fumigated plants. Many of these injured varieties may withstand the treatment when fumigated at the proper season and temperature. A total of 51,504 plants was fumigated throughout the Japanese beetle regulated area during January, bringing the grand total of plants fumigated to date to 636,518. On January 25 a demonstration was conducted at Arlington, Mass., with some winter-grown annuals. A fumigation chamber at a nursery at Little Silver, N. J., was completed for approval during the month. Another chamber at a Pittsburgh nursery was installed by a commercial firm during the month and is now ready for final testing. This same firm is constructing a chamber for a large Ohio nursery. Both of these chambers are of approximately 240-cubic feet capacity. An inquiry has been received from another nursery that plans this spring to construct a chamber large enough to fumigate a carload of stock at once. The nurseryman states that he intends to fumigate from 8 to 10 carloads as soon as the ground thaws enough for digging and wishes to complete these orders in from 2 to 3 weeks. The bulk of his material is yew and hemlock, both of which have reacted favorably to methyl bromide thus far. Two nurserymen in New York and 1 each in Connecticut and Pennsylvania are contemplating the construction of fumigation chambers in the near future, but are withholding actual construction until after the public conference to consider the Japanese beetle quarantine to be held in Washington on February 27.

Cold weather affects plant shipments.--In the northern districts of the Japanese beetle infested zone there was a complete cessation of plant movement, the ground being in no condition for digging and temperatures being too low to risk shipping. In the New York City area upwards of 30 inches of frost was reported in some localities. One grower of perennials in that section worked for 2 hours with a crowbar to get out 100 perennials that he wished to have inspected for shipment. Several New Jersey establishments reported that stock had been frozen in their storage sheds, an unusual occurrence for that State. Other shippers stated that western and southern shipments of stock had been returned because of freezing. Excellent prospects were reported by some of the large establishments in the area, with advance orders for as much as 15 carloads of evergreens, 100,000 azaleas, and $20,000 worth of general nursery stock. A southern New Jersey shipper has orders for his entire stock of a million asparagus roots. Another grower reports orders for 4,500 rhubarb roots. Both of these lots will require inspection.

Grower used fumigation chamber to control greenhouse pests.--A central Pennsylvania greenhouseman who has constructed an approved methyl bromide fumigation chamber for the purpose of obtaining Japanese beetle certification for his potted material is now utilizing the chamber to combat other pests that are infesting his stock. This grower reports that he has had considerable difficulty with whitefly and mealybugs on his pelargoniums and poinsettias. Using his fumigation chamber with a charge of one of the commercial cyanide compounds, he has been successful in ridding his plants of these two species. The plants came through the treatment without noticeable injury. These fumigations were entirely independent of those for Japanese beetle certification and the plants were returned to the greenhouses. In using the cyanide fumigant the blower was operated in the usual manner to aerate the chamber at the end of the fumigation period. This grower states that he intends to try methyl bromide for this same purpose when he has had an opportunity to figure out a smaller dosage than that used in fumigating plants for Japanese beetle certification.

Pamphlet issued describing construction details of an approved fumigation chamber.--A 20-page loose-leaf booklet containing photographs of an approved methyl bromide fumigation chamber, along with a description and plans for its construction, was issued to inspectors of the Division early in January. This booklet has been approved for distribution to nurserymen affected by the Japanese beetle quarantine regulations, who desire to erect such chambers.

Inspectors furnished with first-aid kits.--First-aid kits have been made a part of the equipment of each Federal car or truck used by Japanese beetle inspectors in their daily rounds.

Gypsy moth infestations in inspected shipments.--Three hundred and thirty seven gypsy moth egg clusters were found in a carload of lumber inspected at Madison, N. H., prior to shipment to Rochester, N. Y. Approximately 27,000 board feet of lumber was inspected in this heavily infested load. The greater part of the lumber had been piled near gypsy moth-infested hardwood trees. With edgings laid between each layer of boards, the piles furnished an exceptionally favorable location for oviposition on the under surfaces of the boards. There were more egg clusters on the lumber than on the nearby trees. An additional 46 egg clusters were removed from birchbark to be used in the manufacture of novelties, from old lumber to be used in doorways of carloads of cooperage, and from 4½ cords of birch fireplace logs, all of which were intended for destinations outside the regulated area. One egg cluster was also removed from old moss-covered wood inspected in the Portland, Maine, district for shipment to the New York City Sportsmen's Show.

Heavy movement of certified lumber.--Lumber inspections continued heavy throughout January. The infestation found on lumber was much heavier than a year ago. In January 1939, 53 gypsy moth egg clusters were found on 7 shipments of lumber and logs. During the current month, 448 egg masses were removed from 21 shipments of lumber.

Brown-tail moth infestations.--Winter observations in apple and pear orchards along the Connecticut River between Manchester and Concord, N. H., and in the vicinity of Portsmouth, N. H., indicate a considerable increase in brown-tail moth infestation in these sections. The district inspector at Bangor, Maine, has noted a wide variance in the size of brown-tail webs. Most of them are small. In most instances in that district the webs are widely scattered, often occurring singly in small, abandoned orchards.

First-record Dutch elm disease infection.--A first-record infection was reported late in the month in the town of Wallingford, New Haven County, Conn. This confirmed tree is located 1-3/4 miles north of the New Haven Town line, where three other diseased trees were found previously. This tree was first tagged while a scout crew was doing intensive sampling along the Quinnipiac River. At that time the crown of the tree was completely affected and dying back. This confirmation extends the sanitation activities into the built-up section of Wallingford, as well as farther up the river.

Dense bark beetle infestation in apparently normal elm.--Elm-sanitation crews in the eastern section of Orange County, N. Y., found several beetle-infested trees that appear to be alive at a distance of 50 feet, but which, upon closer examination, showed that they had died after setting buds. The trees were literally alive with Scolytus multistriatus Marsh. Very little woodpecker work was noted on these elms.

Filter-bed elm sanitation completed during freeze.--An elm-sanitation crew has completed their activities in those sections around the filter beds in Great Swamp near Ridgefield, Conn., which can be worked only while the beds are frozen. The low temperatures also permitted the completion of other sections of the Great Swamp that are practically impassable unless frozen.

Floods interfere with Dutch elm disease control work in Danbury district.--Heavy rain accompanied by thawing temperatures during the week of January 20 removed all snow and flooded the swamps and streams in the Danbury, Conn., district. Inspection of the Pomperaug River and its tributaries showed considerable spread of elm material suitable for bark-beetle infestation and the creation of additional probable beetle wood. At some points the river had spread back for a quarter of a mile from each bank, carrying large chunks of ice that debarked one side of a number of elms that had been left after pruning or inspection of beetle material. Rechecking of the complete area will be necessary, with removal of trees that are now potential beetle material.

FOREST INSECT INVESTIGATIONS

Water-gas tar shows promise as spray for protecting logs against *Monochamus*.--During the last summer, field tests were made in Petersham, Mass., by H. A. Bess and B. H. Wilford, to determine the relative effectiveness of certain chemical sprays for protecting green logs against insect damage. The logs were cut early in the spring of 1939 from trees felled by the hurricane of September 1938. Thirty-three decks of approximately 50 logs each were used in the study. In December all of the logs were sawed into lumber (about 88,000 board feet), each board was examined for insect and stain defects, and the degrade for these defects recorded. From these data the damage done by insects and stains was computed and studied on the basis of monetary loss, as well as on the basis of volume of lumber damaged. Some of the conclusions drawn from the study are as follows: (1) None of the sprays tested were effective in protecting green logs against bark beetles, flatheaded borers, or ambrosia beetles. (2) One of the sprays, water-gas tar, appears to have been effective against sawyers (*Monochamus*). (3) It is questionable whether spraying the logs individually before decking gave appreciably more protection than spraying the logs by decks. (4) There is evidence that green white pine logs cut after July 1 and stored on cool, shady sites were damaged very little by insects. (5) The data obtained at the time the logs were sawed showed that the estimate or measure of insect abundance and damage, obtained by barking 5 of the 50 logs in each of the decks examined in October, was not an adequate one for evaluating the effectiveness of the sprays. (6) The location of the log decks with respect to each other, even though relatively short distances were involved, apparently had an appreciable effect on the population density of some of the insects encountered; consequently, it is important to consider this point in the location of checks and replicates. (7) The loss in degrade due to insect and stain defects in the unsprayed check decks of white pine logs amounted to about $2.50 per thousand board feet of lumber, or about 7 to 9 percent of the original value of the lumber.

Consistency in egg laying by mountain pine beetle.--W. D. Bedard, Coeur d'Alene, Idaho, has found a marked consistency in the average number of eggs deposited by female mountain pine beetles during the last 3 years within the study areas on the Coeur d'Alene National Forest. During 1936 the average number of eggs per egg gallery was 50.05, with an average of 50.29 eggs per gallery during 1937 and 50.19 in 1938. Egg galleries ranged in length from 1 to 23 inches, with an average of 11 inches, most of the eggs being deposited between the second and twelfth inch.

Control of western pine beetle in Salmon National Forest.--J. C. Evenden, Coeur d'Alene, reports that an outbreak of the western pine beetle (*Dendroctonus brevicomis* Lec.) within the ponderosa pine stands of the Colson Creek drainage of the Salmon National Forest was revealed during a survey of this area during the past season. Although the situation was not overly severe, control measures were considered necessary and steps were taken to treat the infested trees. T. T. Terrell visited this area in January and spent several days in the training of forest officers in methods of spotting and treating. The project will be completed some time in March, with C. C. C. laborers.

Pityophthorus twig infestation found in northern California.--An insect infestation in the twigs of ponderosa pine reproduction was found by P. C. Johnson in August 1939, near Van Bremmer Well, on the Shasta National Forest, Calif., while on reconnaissance for the forest-insect-hazard inventory of the Berkeley, Calif., laboratory. The damage was confined to an area of from 10-20 acres, but nearly all small pines within this space were attacked. The injury consisted of the killing of the current twig growth on lateral and terminal branches by two scolytid beetles later determined by M. W. Blackman as Pityophthorus confinus Lec. and P. hopkinsi Blkm. At the time of examination the heavy broods were chiefly in the new adult stages, with a few pupae still present. All classes of reproduction were attacked, with apparently little choice shown between healthy or poor individuals. A serious frost the previous winter was believed to have been a contributing factor in the occurrence of this infestation.

Hazard inventory results used in planning forest management.--The usefulness of data collected by the Inventory of Hazard which, for the last 3 years, has been a project at the Berkeley laboratory, is being proved by application in plans for managing forest areas in California. This inventory secures figures on stand volumes, amount of insect-caused loss, and volume of timber in trees likely to die from insect attacks. K. A. Salman, Berkeley, reports that recently those figures have been used freely by the Forest Service in preparing management plans for a 209,000-acre tract of timber in Modoc County. The figures applicable to another 92,000-acre tract in the same county have been requested for use in preparing plans for the utilization of the timber on that area. Private lumber companies also are utilizing information that has been gathered by field crews. One company has requested and expects to use the inventory figures for loss and risk in preparing a program for the utilization of timber on a 75,000-acre tract in Shasta County.

Mealybug on Engelmann spruce.--During a survey of insect conditions made in November 1939 by Dwight A. Hester, Fort Collins, Colo., a mealybug was found to be infesting Engelmann spruce on Thousand Lake Mountain, Fish Lake National Forest, Utah. The trees in this stand of about 6,000 acres, situated at an elevation of about 10,000 feet, were heavily infested with this insect, which was later identified by Harold Morrison as Puto sp. The underside of dead limbs appeared white, and some living terminal shoots were nearly obscured by the cottony masses. Little is known about the damage this insect causes to conifers and, although the present unhealthy condition of the stand is thought to be caused by the mealybug, further study may show that other agencies are primarily responsible.

Bark-beetle attack and development in elm trees cut on different dates.--An experiment under the direction of C. H. Hoffmann, of the Morristown, N. J., laboratory, was begun in 1939 to determine the following with respect to the smaller European elm bark beetle (Scolytus multistriatus (Marsh.)) and the native elm bark beetle (Hylurgopinus rufipes (Eich.)). The experiment involved (1) the dates of earliest and latest attack in the field, (2) span and peaks of emergence of adults as dependent on date of attack, and (3) number of generations. Beginning on April 14, an elm tree was felled in the field at Chatham, N. J., every 2 weeks up to and including September 15, and after that one every week until October 27. After 2 weeks' exposure in the field, each tree was sectioned and the logs placed in rearing containers so that beetle emergence could be recorded. The tree felled on April 28 was heavily attacked by H. rufipes and issuance of the next generation of adults was heavy during July and August. Some adults continued to emerge even in October. A few adults of this species attacked trees cut on May 15 and June 16. Attack by S. multistriatus was generally heavy in all trees cut from May 15 to October 6, inclusive. Trees cut May 15 and May 31 produced large numbers of S. multistriatus adults during July and August. Those cut on June 16 and July 1 yielded most emergence during August and September. The one cut July 15 gave moderate emergence during September and October, while those cut July 31 and later yielded none, or only a few beetles in 1939. The tree cut October 6 was the last one on which S. multistriatus attack was noted. In many trees the bark beetles are overwintering as larvae. After the completion of adult emergence in 1940 more detailed data should be available concerning the points which were in mind when the experiment was started.

Dutch elm disease fungus spreads in bark-beetle-infested logs.--An experiment conducted in 1939 by W. D. Buchanan, of the Morristown, N. J., laboratory, indicates that the Dutch elm disease fungus may spread extensively from the point where it is introduced into an elm log by an adult of the smaller European elm bark beetle (S. multistriatus). Adults artificially contaminated with the fungus were caged near 1 end of each of 21 freshly cut elm logs in June. Each log was 10 feet long and all logs were free of the fungus at the beginning of the test. Other adults, free of the fungus, were allowed to infest the remaining portions of the logs. Later when the larvae that were the progeny of the contaminated and noncontaminated adults were nearly mature, the logs were cut into short sections and placed in bags. Still later, larvae and adult specimens were taken from these sections and cultured by C. S. Moses, of the Bureau of Plant Industry. The fungus was obtained from specimens that developed in sections from 1 foot to 8½ feet distant from the parts of the logs on which contaminated beetles were originally placed. It is not known how the fungus spread through the logs.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

Gypsy moth work in areas adjoining barrier zone.--Dispersal of small caterpillars by the wind is one of the common means of spread of the gypsy moth. Exposed colonies on high elevations may be the cause of infesting areas several miles away. Because of this condition, and in order to reduce such spread into the barrier zone, considerable work is done by this Bureau in towns to the east of the barrier zone where especially dangerous infestations occur. Gypsy moth scouting crews are finding occasional small and widely scattered colonies in towns immediately east of the barrier zone, where the gypsy moth infestation has built up rapidly during the last 2 or 3 years and is now quite general. Every effort is being made to reduce the infestations at the most dangerous points so that the windspread into the zone may continue to be held in check.

Gypsy moth scouting on artillery reservation.--Scouting work has been under way for several weeks in a section of Jericho Township, Chittenden County, Vt., embraced by the U. S. Military Reservation, which is used for artillery practice. The reservation covers a large area that extends from Jericho into the townships of Underhill and Bolton. As has always been the case, satisfactory arrangements were made with the military officials at Fort Ethan Allen so that gypsy moth scouting work could be done in the reservation during the winter months, when the range was not in use. The gypsy moth scouts were cautioned not to disturb any unexploded shells that might be discovered, because of the danger of an explosion if the shells were touched or moved. These shells are exploded by trained Army personnel, using devices especially designed for that purpose. Although the section to be scouted this winter is heavily wooded and extremely rugged, it is expected that all necessary work will be completed before the resumption of artillery practice early in the spring.

Private work aids gypsy moth control.--The reduction of the numbers of species of trees and shrubs favored as food by the gypsy moth, and the encouragement of the growth of species less favored as food plants, is one of the methods used to reduce the gypsy moth population. Obviously, because of labor and cost limitations, this can be done only in comparatively small sections where special conditions render such work particularly desirable. However, it sometimes happens that work done by private agencies is of incidental assistance to this branch of gypsy moth work. Such a case recently occurred in Sheffield, Berkshire County, Mass., where a property owner started chopping out gray birch growth from a gypsy moth infested wood lot, to use as fuel, leaving a well-distributed stand of young white pine. As gray birch is one of the most favored food plants of the gypsy moth while white pine is much less favored, this work will contribute considerably to the development of a stand of trees which will be resistant to gypsy moth attack.

Small infestations found in Pennsylvania.--Scouting work has been completed at the three assembling cage sites in Dennison Township, Luzerne County, Pa., where male gypsy moths were captured last summer. No sign of infestations were found at any of the sites. Work around nine assembling cage sites in Kidder Township, Carbon County, has been completed, and resulted in the discovery of three infestations. Work still remains to be done around several additional cages that attracted moths in this township. A small gypsy moth infestation was located in a State Game Preserve in Lehigh Township, Lackawanna County. The site of this infestation is rocky, with inferior tree growth.

Efficiency of gypsy moth work demonstrated at Pennsylvania infestation.--Scouting work recently completed at an infestation in Lackawanna Township, Lackawanna County, Pa., revealed a decided reduction in the intensity of gypsy moth infestation from that of the previous year. Approximately 25,000 egg clusters were creosoted at this infestation last year, while fewer than 250 egg clusters were found this season. In addition to the creosoting, a part of this area was sprayed with lead arsenate last June.

Scope of brush burning in Pennsylvania.--Exceptionally fine conditions for burning brush prevailed in Pennsylvania during the first part of January, as a light blanket of snow had reduced the fire hazard to a minimum. An idea of the magnitude of this branch of gypsy moth work can be obtained from the work in one section of Spring Brook Township, Lackawanna County, where more than 500 piles of brush and deadwood were burned in 1 week in an area of approximately 37 acres. This represented only a small proportion of the brush burned in Pennsylvania during that short period.

C. C. C. gypsy moth work increases.--Since the hurricane of September 1938, the number of man-days taken from planned C. C. C. gypsy moth work and used on various types of emergency work made necessary by the hurricane has greatly exceeded the number of man-days left to gypsy moth work. The men have gradually been returned to gypsy moth work during the last few months until, during January, the number of man-days used on gypsy moth work reached the highest total since the hurricane, and the time used on gypsy moth projects exceeded the time taken from gypsy moth work for the first time. In Massachusetts, one entire camp, two crews from another, and one crew from a third camp are now being used on gypsy moth work and there is a possibility that the personnel of a fourth camp will be returned to gypsy moth work in the spring. In Connecticut, two crews from each of two camps and one crew from another camp are now employed on gypsy moth work, while one crew from a fourth camp was removed from gypsy moth work during the month. In Vermont two crews from one camp and approximately one-half the enrollees of another camp are now being used on gypsy moth work, with the possibility that a third crew may be added from the first camp. Plans of work calling for 152,600 man-days of gypsy moth work in Vermont, Massachusetts, and Connecticut have been compiled for the 15th and 16th periods, which begin on April 1, 1940, and the plans have been sent to the camps doing gypsy moth work under the supervision of this Bureau for inclusion in the work plans of the camps. With this labor it is planned to scout approximately 226,400 acres of woodland and open country, to apply burlap bands to the trees on 2,000 acres, and to do gypsy moth thinning and cleaning work on 6,105 acres.

Special silvicultural work being done in Connecticut.--Two crews of approximately 20 C. C. C. enrollees each, 1 crew from each of 2 camps, are now working in an area between the barrier zone and the Connecticut River in the southern part of Connecticut. They are doing silvicultural work, under the direction of the State Foresters, which will make the woodland areas less susceptible to gypsy moth increase. The work includes the reduction or elimination of the species of growth most favored as food by the gypsy moth and the encouragement of the growth of less-favored species.

PLANT DISEASE CONTROL

Barberry eradication.--Tom Van Zanden, leader in charge of barberry eradication in West Virginia, summarizes accomplishments for the calendar year 1939 as follows:

County	Maximum laborers	Man-days	Area covered	Properties cleared	Bushes destroyed	Salt used
	Number	Number	Sq.mi.	Number	Number	Tons
Berkeley----	11	987	237.44	5	[1]747	0.860
Greenbrier--	75	7,159	31.98	25	1,205,700	46.775
Jefferson---	11	872	136.89	4	[1]224	.120
Monroe------	88	8,236	13.28	92	10,899,584	407.080
Pocahontas--	13	776	10.14	2	[1]33	.240
Summers-----	24	3,057	4.55	35	3,680,651	124.009
Total-----	222	21,087	434.28	163	15,786,939	579.084

[1] *Berberis vulgaris*, all others *B. canadensis*.

Salt brine used for eradicating native barberries.--During the last year the salt-brine method of eradication has been employed more extensively than heretofore. Prior to instituting this method on a large scale, field tests were conducted and the data obtained were largely responsible for the development of this activity to a point of major importance in the eradication of *B. canadensis*. The brine method of treatment was first employed on on a limited scale in 1938. A 1½-ton truck hauled barrels filled with water as near to the point of operation as possible and from there laborers carried it in 10-gallon drums to the site of eradication operations. A 600-gallon tank mounted on a 1½-ton chassis, powered to pump water into and out of the tank is now in use in this State. The motor-driven pump will force water for a distance of several hundred feet through a 3/4-inch hose, thus permitting the brine to be mixed at the point of application. While the use of brine is not practicable under all circumstances, experiences of the past year have shown that where water is readily available and topography will permit using the tank truck, the cost of applying salt in solution is a little more than half the cost of eradicating bushes with dry salt. There is a saving in both the amount of chemical used and in labor costs.

Three plant diseases added to list in West Virginia.--A notice received from J. B. McLaughlin, commissioner of the West Virginia Department of Agriculture, Charleston, W. Va., effective January 1, 1940, states: "The discovery of the London plane disease, a new and not heretofore known disease of the plane and sycamore, in this State, the expansion of the barberry-eradication campaign for the suppression of black stem rust of wheat, and the discovery of the cause of the death of the elms in the southwestern areas of the State, makes it necessary that these three plant diseases be added to the list of plant pests considered as dangerously injurious." No other change is made in the Regulations by this revision.

Blister rust control conference held in New York State.--A conference of the New York district leaders was held at Syracuse, N. Y., on January 24 and 25. In addition to the district leaders, the following men attended the meeting: H. L. McIntyre, State leader; Henry Clepper, executive secretary of the Society of American Foresters; J. A. Cope, extension forester of New York; E. W. Littlefield, in charge of forest investigations in New York; Ray R. Hirt, of the New York State College of Forestry; and Messrs. Rusden and Filler, of the Regional Office at Cambridge, Mass. Each district leader presented a summary of his accomplishments in 1939. These reports showed a decrease of 10 percent in man-days of employment during 1939 and an increase of 9 percent in the acreage protected over that of 1938, even though the Ribes factor was practically the same for both years. Professor Cope gave an instructive talk on "Woodland Management." Dr. Rusden reported on the results of blister rust infection studies made in New York during 1939, and E. C. Filler discussed "Administrative Matters and Special Control Problems in New York and Other States." Noble Harpp and H. G. Strait presented interesting papers on "Uses of White Pine" and "Reproduction of White Pine under Hardwoods." Preliminary work plans were developed for the 1940 field program and decisions were reached on several control problems.

Increased productivity of Ribes-eradication work in Northeastern States.--Final reports from the blister rust control leaders of the Northeastern States show that 700,141 acres were cleared of Ribes during 1939, a decrease of 5.6 percent from 1938. This decrease apparently was due largely to a loss of 21.7 percent in the number of man-days of employment, as compared with 1938. Although there was a slight increase in the number of Ribes per acre in 1939, an average of 4.4 acres was worked per man-day. This is an increase of 22.2 percent over 1938 and may be attributed to the following factors: Better training of laborers prior to application of control measures; close supervision; greater use of scout formation in favorable locations; and the stimulus of productivity ratings, which developed a friendly spirit of competition among the crews. In using the production quotients, it was continually emphasized that quality should not be sacrificed for quantity. Numerous checks on the field work during 1937 showed that the quality equaled or exceeded that of previous years.

Blister rust control in Southern Appalachians in 1939.--Ribes eradication was carried on in the 8 States of Delaware, Georgia, Kentucky, Maryland, North Carolina, Tennessee, Virginia, and West Virginia during 1939. In this work 3,129,928 wild Ribes and 100,923 cultivated Ribes were destroyed on 491,106 acres, with 34,218 man-days of labor. Of the above acreage 359,132, or 73 percent, was initial work. Blister rust control has been carried on in the national forests of this region since 1928 and in national parks since 1933. In 1939, Ribes bushes were eradicated on 151,072 acres of national forest lands and 13,726 acres of national park lands, the total acreage worked on Federal lands being 164,798, or 33 percent of the total acreage worked in the region. Nursery sanitation was carried on around 27 nurseries in 6 States. These nurseries contained 452,000 white pines. In this work 7,755 wild Ribes and 114 cultivated Ribes were destroyed on 7,836 acres. In Maryland and Virginia, where the blister rust has spread most, 466,754 white pines were examined and 17,112 trees were found infected. Of the latter, 2,704 were cut down because they were fatally diseased and 14,408 were treated by removing 70,558 cankers, an average of about 5 per tree. Preeradication surveys for white pines were carried on in all States, 495,320 acres of white pine being mapped.

COTTON INSECT INVESTIGATIONS

Insecticide tests against cotton insects.--G. L. Smith, A. L. Scales, and R. C. Gaines report the results of cage tests conducted at Tallulah, La., during 1939. The Division of Insecticide Investigations separated each of two samples of calcium arsenate into four fractions, according to

LIBRARY
STATE PLANT BOARD

particle size, and found a definite relation between particle size and water-soluble arsenic pentoxide, tested by the New York method. The coarsest samples contained the highest percentage and the finest samples the lowest percentage of water-soluble arsenic pentoxide. The calcium arsenates with the larger particles and higher percentage of water-soluble arsenic pentoxide produced higher boll weevil mortality than did the calcium arsenates with smaller particles and lower percentage of water-soluble arsenic pentoxide. The authors summarize an extensive series of cage tests conducted in 1939 as follows: "Positive correlations are shown between net boll weevil mortality and percentage of water-soluble arsenic pentoxide, by the New York method, with calcium arsenate fractions prepared by means of a centrifugal air separator. Ordinary commercial calcium arsenate was more effective against the boll weevil and cotton leaf worm than any of the four cryolites tested with or without wetting agents. The definite compound dicalcium arsenate was more effective against the boll weevil and the cotton leaf worm than was commercial calcium arsenates, mixtures thereof with sulfur, imported calcium arsenate, and basic copper arsenate. Calcium carbonate and sulfur appeared to be better carriers for calcium arsenate than lime. Calcium arsenate-sulfur mixtures caused a higher mortality of adults of Lygus pratensis oblineatus (Say) than did sulfurs alone. The addition of wetting agents to calcium arsenate and to cryolites did not affect significantly the insect mortality."

Winter activity of pink bollworm in lower Rio Grande Valley.--In order to determine the possible carry-over of the pink bollworm by continuous breeding on cotton from one crop to the next, L. C. Fife, with the aid of several assistants supplied by the Division of Pink Bollworm and Thurberia Weevil Control, has made examinations in the green fruiting forms of cotton during the fall and winter moths. After July 1939 examinations were largely confined to squares that had developed on the new growth of old cotton stalks where the plants had been cut off at the soil surface several weeks before. However, many green fruiting forms were also found on plants growing in waste places at the end of cotton fields or from scattered plants in old abandoned fields that had been in cotton a few years previous. Pink bollworm larvae in all stages of development have been found in the green fruiting forms of cotton every month from June to December 1939, inclusive. During the period January 18 to 26 a severe cold spell occurred, destroying all the green fruiting forms of both cotton and okra and making further investigations impossible.

Pink bollworm infestation in okra in lower Rio Grande Valley.--About 2,000 acres of okra are grown annually in the quarantine area of the lower Rio Grande Valley during the winter months for shipment of the green pods to markets further north. With the aid of assistants supplied by the Division of Pink Bollworm and Thurberia Weevil Control, Mr. Fife made examinations of green okra pods from August 1939 to January 1940, inclusive, to determine its importance as a host plant of the pink bollworm and the possibility of the pest being disseminated in commercial shipments of okra. Pods were found infested only during August, September, and October. The average percentage of mature green pods infested in any month did not exceed 0.7 percent and the highest percentage in any field was 6 percent. In young edible pods the highest infestation found was 3.4 percent. The results indicate that the pink bollworm does not carry over from one cotton crop to the next by continuous breeding on okra and that the pest is likely to be disseminated to uninfested areas further north in commercial shipments.

Crocidosema plebeiana in cotton and other Malvaceae.--With the aid of assistants from the Division of Pink Bollworm and Thurberia Weevil Control, F. F. Bibby made a study of occurrence of Crocidosema plebeiana Zell. in the green fruiting forms of cotton, okra, and 14 other species of malvacous plants in the lower Rio Grande Valley of Texas and Mexico. This species is of special interest, as its work and habits are almost identical with those of the pink bollworm and also because the larval stages so closely resemble those of this pest that they can be distinguished only by a careful examination of the arrangement of the setae. The mature larvae of this species are usually pinkish in color and the outer crochets of the abdominal prolegs are often weakly developed or absent, whereas in the pink bollworm the outer crochets of the abdominal prolegs are always absent. C. plebeiana feed chiefly inside the seed capsules and on the seeds; therefore the larvae are likely to be confused with the pink bollworm. Larvae of C. plebeiana in all stages of development have been found frequently in the green okra pods and only occasionally in green fruiting forms of cotton. It has also been found to occur commonly in other malvaceous plants as follows: Abutilon berlandieri, A. hypoleucum, A. trisulcatum, Anoda pentachista, Hibiscus mutabilis, Malachra capitata, Malvastrum americanum, M. spicatum, Malvaviscus arboreus, M. drummondii, Sida angustifolia, S. cordifolia, Wissidula amplissima, and W. holosericea. Identifications of the larvae were verified by C. Heinrich, of this Bureau.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Field clean-up in Glendale, Ariz., area.--Pink bollworm infestation was first established in the Salt River Valley of Arizona during the 1929 cotton crop. Infestation was eradicated from that area during the next few years but reappeared in the eastern part of that valley in the 1938 crop. No infestation was found in the Glendale section of the Salt River Valley in 1938, but during the 1939 crop season gin-trash inspection revealed that a fairly heavy pink bollworm infestation existed in approximately six fields near Glendale. In known infested Arizona areas it was found that infestation existed only in a very light degree in the 1939 cotton crop; consequently, arrangements were made to clean up approximately 3,000 acres of cotton land near Glendale with State and Federal funds, in cooperation with the farmers affected. This work was begun during the first few days of January and very good progress has been made. At the end of the month stalks had been cut and raked on the greater part of this acreage and several hundred acres had been hand-raked and hand-picked. The hand-raking and picking of cotton debris is being done only in fields actually known to be infested. Considerable difficulty was experienced in cleaning some of the fields that had been planted to SXP cotton. It appears that this variety of long-staple shatters much worse than does Pima. Several of these fields contained unusually large amounts of open cotton which had been beaten into the ground by previous rains and was partially covered by soil, making its removal very slow and difficult.

Destruction of soca cotton and random plants in south Texas regulated areas.--Field clean-up in south Texas was first applied in the lower Rio Grande Valley in 1937, and has been undertaken each year following the harvesting of the cotton crop. This policy was determined upon by Federal and State authorities following initial pink bollworm findings in the Brownsville-Matamoros area of Texas and Mexico in the 1936 cotton crop, in an effort to eradicate or suppress the infestation. Funds appropriated for control work in south Texas for the 1939 crop season made it possible to carry on an intensive campaign, following completion of the planned stalk-destruction program, to eliminate all seedlings and sprout cotton which developed after fields had been accepted as being in compliance. There is also a large amount of soca cotton in that area which it is necessary to eliminate in order to shorten the cotton-growing season and deprive the pink bollworm of food on which to live. "Soca" refers to sprouts growing from roots of cotton planted prior to the current crop season, and the old plants may or may not have been cut off near the ground. Much of the "soca" cotton grows in abandoned fields or where it persists in growing along with cultivated crops. The type of cotton now being eliminated is one of the major problems in control work in the lower Rio Grande Valley, where cotton as a rule develops and bears fruit throughout the year. This cotton must be grubbed out, and during January 26 crews were used in that work. Between January 18 and 27, however, temperatures were unusually low in the lower valley, severely damaging the tender parts of the cotton plants. Therefore all crews were laid off until the last few days of the month, when 11 crews were put back to continue the grubbing out of this cotton. Continuation of this work is essential in order that no squares be produced prior to the time when the 1940 planted crop comes into bearing. During January soca cotton was grubbed from more than 5,000 acres, and sprout cotton and seedlings were removed from approximately 18,500 acres of cotton planted in 1939. To date a total of 22,794 acres of soca has been cleaned and sprouts and seedlings have been grubbed from more than 29,000 acres of fields planted in 1939. Also, during January, soca cotton was grubbed out on several hundred acres of land in Coastal Bend counties, immediately adjacent to the lower Rio Grande Valley area.

Trap plots in the lower Rio Grande Valley.--As previously mentioned, uniform planting dates for the 1940 cotton crop have been established for the counties comprising the lower Rio Grande Valley of Texas and the heavily infested area of the lower valley of Mexico in an effort to strengthen the control program in that region. To supplement the benefits which may be derived from observance of the planting-date regulations, steps were taken by Federal and State authorities of this Department, and officials of the Mexican Department of Agriculture, to establish trap plots of cotton along both sides of the Rio Grande in the Brownsville-Matamoros area, where the heaviest pink bollworm infestation existed in the 1939 cotton crop. The purpose of the trap plots is to plant them far enough in advance of the 1940 cotton crop that the plants will reach the fruiting stage several weeks earlier than the main crop, and attract emerging moths, drawing them away from commercial cotton when it begins to fruit. About the middle of January, 15 of these trap plots, consisting of about ½ acre each, were planted on the Texas side of the Rio Grande and 12 plots were planted on the Mexican side. All blooms will be picked from these plots each day, to avoid possibility of propagation, and at the proper time all plots will be destroyed.

Wild-cotton eradication.--Since 1932, when it was discovered that wild cotton growing in southern Florida and adjacent islands was infested with the pink bollworm, from which it was being disseminated to domestic cotton plantings in northern Florida, a determined effort has been under way to eradicate this insect from that region. Extermination of this pest is being attempted by the only known method of control--destruction of its host, wild cotton, and considerable success has been obtained in the elimination of this plant and the consequent reduction in pink bollworm infestation. Good progress was made in this work in all areas during January, and in the Cape Sable area, where a C. C. C. camp has been established to aid in wild-cotton eradication, the enrollees showed considerable improvement in efficiency over December operations. In addition to the company of C. C. C. enrollees operating in the Cape Sable area, 12 W. P. A. crews operated on the main keys and along the west coast, and 2 Bureau crews carried on eradication work from a houseboat in remote areas inaccessible by land. For the period about 5,300 acres were covered, from which approximately 8,600 mature plants, 359,700 seedlings, and 1,665 sprout plants were removed. In January incidental inspections of wild cotton bolls, squares and blooms, were made from time to time throughout the area by the various inspectors operating in the field. As a result of such inspection, 1 pink bollworm was taken at a point in the extreme western portion of the Cape Sable area and 2 specimens were found in the Florida Bay section.

Thurberia-plant eradication.--A plant known as Thurberia thespesioides, closely resembling wild cotton, exists in many of the mountain ranges of southern Arizona. This plant is heavily infested with a weevil which also attacks commercial cotton and is a possible host to the pink bollworm. In 1935 it was found that this weevil was making its way from these wild plants in the Tortillita and Santa Catalina Mountains to domestic cotton plantings in the Santa Cruz Valley, these two ranges at that time constituting all of the area which drained into the vicinity of cultivated cotton. A program was therefore initiated in 1935 to eradicate these plants from these two adjacent mountain ranges in an effort to prevent the spread of this insect to cotton-producing sections throughout the United States. Funds for this project have been provided principally through W. P. A. allotments, and this work has been carried on to the present time with good success. The first coverage of these two ranges was completed several months ago, and a review of the region was at once begun to ascertain whether any plants had been missed and to remove any sprout or seedling plants that might have developed since the first cleaning. The recheck of the Tortillitas was completed during the latter part of January and the Santa Catalinas was immediately reentered for a second coverage. The second cleaning of these mountain ranges indicates that very few plants were missed during the initial coverage and that comparatively few sprout plants and seedlings have developed since.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Distribution and intensity of tobacco moth infestation in growers' pack houses.--A survey conducted during the season of 1939 by C. F. Stahl and W. A. Thomas, of the Oxford, N. C., laboratory, disclosed that no established infestations of this pest occur in either the Georgia or the South Carolina Tobacco Belts. In the Eastern Belt little economic injury has occurred, except in the immediate vicinity of Farmville, N. C. Light infestations occur, however, in the vicinity of Wilson and Greenville, N. C., with a very localized infestation at Kinston. Scattered infestations were also found in the area extending from Farmville to Greenville. The principal economic injury in the Middle Belt occurs in the Durham, N. C., area, extending northeastward to Creedmoor and north to Rougemont, with lighter infestations for an undetermined distance beyond these limits. The degree of infestation was found to decrease in the area south, east, and west of the Durham area. A fairly heavy infestation occurs in Johnston County, N. C., with its focal point just south of Wendell and extending in a lesser degree to within a few miles of Selma. By far the largest single infested area seems to occur in the Old Belt extending intermittently from Winston-Salem to Reidsville, N. C., Danville, Va., and Chatham, Va., with two apparent focal centers located at Reidsville and Danville. The principal economic injury occurs in the vicinity of these two focal centers. A light infestation is present in the vicinity of South Boston, Va., in Halifax County, with a few isolated infestations in Mecklenburg, Henry, and Patrick Counties, Va. In general, there has been no increase in the intensity of tobacco moth infestation in growers' pack houses in 1939, as compared to 1938.

Temperature and humidity affect action of pyrethrum sprays against beet leafhopper.--In summarizing the results of laboratory tests designed to determine the effects of temperature and humidity on the insecticidal action of pyrethrum sprays against the beet leafhopper, F. H. Harries, J. D. DeCoursey, and R. N. Hofmester, of the Twin Falls, Idaho, laboratory, report that the percentage of leafhoppers killed by a pyrethrum-oil spray was significantly greater at temperatures of 60° F. than at higher temperatures of approximately 100°. Also, that a distinct trend was exhibited toward a greater percentage of leafhopper kill at lower relative humidities than at higher relative humidities, although the observed differences were not statistically significant in all instances. Significant differences in percentage of leafhopper kill were obtained, however, in comparing results at relative humidities of 20 and 80 percent, when exposed to a temperature of 60°. The effect of extremes of 20 and 80 percent relative humidity was comparatively slight in comparison wih the influence of temperature differences in a range of 40°. The pyrethrum-oil sprays used in these tests consisted of 1 part of pyrethrum extract, containing not less than 2.5 percent of pyrethrins by weight, or 2 grams per 100 cc., to 500 parts of oil. Pyrethrum proved to be more effective in a base of light oils than in heavier oils, and the efficiency of sprays at higher temperatures was not increased by using heavier oils. A higher mortality was obtained when the leafhoppers were sprayed at 100° than at 60°, when the treated insects were placed immediately after treatment under the same temprature-humidity conditions (80° and 50 percent relative humidity) and held under these conditions for 24 hours. It appeared that most of the insecticidal action of the pyrethrum-oil spray was caused by the pyrethrum, but the oil content was also shown to have some action. The effect of temperature on the efficiency of pyrethrum-water sprays used in these tests, consisting of 1 part of pyrethrum extract to 400 parts of distilled water, was similar to that found with pyrethrum-oil sprays.

Gladiolus thrips controlled with reduced dilution of tartar emetic.--As the result of experiments performed during the season of 1939, G. V. Johnson, of the Beltsville, Md., laboratory, found that sprays made up at the rate of 2 pounds of tartar emetic and 4 pounds of brown sugar per 100 gallons of water gave a degree of control of Taeniothrips simplex Morison equal to the formerly recommended dosage of 4 pounds of tartar emetic and 16 pounds of brown sugar per 100 gallons of water. Also, it was determined in a series of comparative tests, that a commercially prepared calcium antimony tartrate could be substituted for tartar emetic, provided an equal quantity of antimony was present in the spray.

Lime-sulfur sprays and bentonite-sulfur dust mixtures effective against red berry mite.--B. J. Landis and W. W. Baker, of the Puyallup, Wash., laboratory, report that an analysis of the results obtained in experiments in 1939 demonstrated that a satisfactory control of *Eriophyes essigi* Hassan could be achieved in fields that had not been sprayed for the control of this mite during the previous year, by making either 2 applications of lime-sulfur (6-100) spray, or bentonite-sulfur dust mixture. The latter appears to be an excellent substitute for the lime-sulfur against the mite. The addition of a sticker to lime-sulfur appeared to increase slightly the degree of control obtained. Experiments in adding various materials, particularly manganese sulfate, aluminum sulfate, iron sulfate, and magnesium sulfate, to lime-sulfur sprays just prior to blooming, in an attempt to overcome the shock caused by sulfur on brambles indicated that (1) the leaves produced on blackberries where iron sulfate was applied were of a darker green than leaves on plots where this material had not been applied or from plots where the other listed materials were applied; (2) aluminum sulfate appeared to damage the developing flowers and fruit; and (3) a greater number of mite-infested berries were found in plots where these materials were applied than in plots where they were not applied. In general, none of the materials corrected the slight yellowing of the foliage ordinarily attributed to the application of lime-sulfur for red berry mite control. It was found that the application of various oil sprays were less effective than lime-sulfur sprays in protecting the plants from the red berry mite throughout the season in instances where a single application was made to plants at the time the cane buds were opening.

Insufficient curing renders narcissus bulbs susceptible to injury from hydrocyanic acid gas.--C. F. Doucette, of the Sumner, Wash., laboratory, reports that during the 1939 season three separate instances were reported to him of injury to narcissus bulbs that had been fumigated with hydrocyanic acid gas to kill larvae of the narcissus bulb fly (*Merodon equestris* (F.)). His investigation confirmed suspicions that the fumigant was the primary cause of injury, but it was also evident that certain physical conditions rendered the bulbs susceptible to such injury. In one instance the roots of the bulbs were still quite plump and moist when the bulbs were fumigated, indicating that the moist condition of the bulbs at the time of treatment was the causative factor. Although the other two instances involved possible causative factors other than insufficient curing, the character of which could not be determined definitely, a variation in the degree of injury to the injured varieties of bulbs, as well as an absence of injury to other varieties of bulbs included in identical fumigations, indicated distinctly that some physical condition of the affected bulbs was the principal cause which rendered them susceptible. Insufficient curing before fumigation is the most probable condition responsible for the injury. Although no injury to narcissus bulbs from hydrocyanic acid gas fumigation, at the recommended dosages and duration, had been observed prior to 1939, these instances of injury emphasize the danger of fumigating bulbs with hydrocyanic acid gas before they are sufficiently dried.

Amyl salicylate more effective and less expensive than isoamyl salicylate as attrahent for hornworm moths.--L. B. Scott and Joe Milam, of the Clarksville, Tenn., laboratory, report that, as a result of testing

80 materials for their chemotropic value in attracting adults of the hornworms Protoparce quinquemaculata (Haw.) and P. sexta (Johan.), amyl salicylate was found to be much more effective, as well as less expensive, than isoamyl salicylate. In grading the relative degree of attractiveness of these materials it was found that n-butyl benzoate, benzyl salicylate, isoamyl benzoate, benzyl alcohol, and amyl benzoate possessed about the same degree of attractiveness to the moths as did isoamyl salicylate. Nine other materials, consisting of isoamyl butyrate, benzyl butyrate, isobutyl benzoate, n-butyl salicylate, benzyl propionate, amyl butyrate, old benzyl alcohol, butyl salicylate, and isobutyl salicylate, were found to be moderately attractive to the moths.

INSECTS AFFECTING MAN AND ANIMALS

Sand flies may have long developmental period.--J. B. Hull and S. E. Shields, of the St. Lucie, Fla., laboratory, report: "Sand flies emerged from one cage over a period of 428 days, the longest period of time, and from another over only 90 days. This shows that the egg and larval stage of Culicoides furens (Poey) (= dovei Hall) can last as long as 428 days. The cage producing sand flies for that time has not produced any for 163 days, showing that no larvae have migrated under the cages in that period of time. This indicates that the sand flies that did emerge under that cage were those either in the egg or larval stage at the time the cage was placed."

Sulfur-cube ineffective against winter tick.--H. E. Parish, of the Menard, Tex., laboratory, finds that spraying cattle infested with Dermacentor nigrolineatus (Pack.) with the following mixture resulted in little or no kill: Wettable sulfur, 100 pounds; derris powder (5% rotenone), 10 pounds; water, 1,000 gallons. This is the formula found effective as a dip for controlling the short-nosed cattle louse.

Methyl bromide as mosquito ovicide.--H. H. Stage and C. M. Gjullin, of the Portland, Oreg., laboratory, report: "On November 29, 1939, four tracts of land heavily infested with eggs of Aedes vexans Meig. and A. lateralis Meig. were treated with methyl bromide which had been dissolved in alcohol and diluted with water. Soil from these tracts which had received the highest dosage (21.8 pounds methyl bromide per acre) was brought in 36 days later and put through the egg-separating machine. It appeared that a normal number of eggs were recovered, and they showed no signs of injury. These eggs were flooded with asparagine-phosphate solution, and 81.3 percent of them hatched. Eggs were also obtained from check tracts which had not been treated with methyl bromide and when flooded with asparagine-phosphate solution gave a 77.3-percent hatch."

FOREIGN PLANT QUARANTINES

Increase in disinfection of imported plant material at New York.--December 1939 was a banner month for the port of New York insofar as commodities disinfected were concerned. During that month 2,240 bales of cotton, 2,010 bales of cotton waste, 10,512 bales of linters, 9,077 hampers of lima beans, 1,240 crates of pigeonpeas, 84 cases of begonia bulbs, 7,207 cases of chestnuts, 3,337 cases of cipollini, and 490 bales of broomcorn were treated as a condition of entry.

Air express records broken by "California Clipper."--All air express records were broken by the trans-Pacific "California Clipper" when she arrived at San Francisco from China via Honolulu on December 30, carrying 485 packages of express matter. Of this total, 114 packages contained plant material subject to inspection. While the contents of these packages consisted entirely of cut flowers and flower leis, they represent a potential pest introduction hazard in that nearly 50 species of insects have been intercepted in the past on similar shipments, many of which are of economic importance and not known to occur in California or, in some instances, not even in the United States. Present shipments are arriving under certified-origin disinfection, with the result that few are now being intercepted carrying live pests.

Mosquito intercepted on "China Clipper."--A live mosquito, Culex quinquefasciatus Say, was taken in the passenger quarters of the Pan-American Airways trans-Pacific "China Clipper" arriving from Hawaii. This species is recorded as a carrier of a disease of humans, "filariasis," more commonly known as "elephantiasis."

Infested fruit intercepted on passenger train.--A Mexican woman residing in San Francisco, Calif., came in at El Paso on the passenger train from Mexico on the morning of December 3, 1939. She had in her possession as baggage one suitcase and three large paper bags. Inspector C. M. Locke made the usual inquiry as to whether she had any fruits, vegetables, or plants in her baggage or possession, to which she replied, "Nothing." It was noticed, however, that she appeared to be nervous after being questioned. Examination of the contents of the suitcase revealed no prohibited plant material. As the inspector proceeded to examine the paper bags, the woman showed considerable interest. In fact, she appeared to be more helpful than the occasion required. This aroused the inspector's suspicion and he placed the three paper bags on a vacant seat across the aisle, where they could be examined in her presence but without interference. In the last bag inspected one guava and half of an unidentified Mexican fruit were found. In the guava were three dipterous larvae which have been identified as Anastrepha sp. No infestation was found in the unidentified fruit.

Restricted plant material from China.--On November 9 there arrived at the Canadian border port of Blaine, Wash., a package of "fresh vegetables" on the express manifest from Vancouver, British Columbia, consigned to a firm in San Francisco. For "fresh vegetables" to be sent from Canada to California in November did not seem exactly correct, and the customs inspector felt it would bear looking into. The examination revealed a top layer of 20 or 30 leaves of kale (fresh vegetables), and under the kale was a layer of excelsior with 61 narcissus bulbs (Chinese sacred lily). The bulbs were confiscated by the customs and destroyed.

Prohibited fruits from Cuba intercepted at New York.--When the S. S. Quirigua arrived at New York on November 26 from Cuba a shipment of 556 packages of tomatoes and 1 package of sour limes, consigned to a New York firm, were offered for entry. The limes were not in a commercial package commonly used as a container for such products, but were packed in a lug of the type used for tomatoes and were apparently included as a present to a representative of the importing firm. An attempt was made to obtain delivery of the package of limes on Sunday night, the night of arrival, but this was refused by customs. Early next morning the drive of the importing company picked up some packages of tomatoes for the auction and also took the lug of limes, presumably believing it to be tomatoes. When the plant quarantine inspector reached the dock an effort was made in cooperation with the customs inspector to locate the package of limes. Being unsuccessful, they realized that this package had been delivered to the auction rooms along with the packages of tomatoes, and the importing firm was ordered by customs to return the package to customs custody. The following day an examination of this package revealed the presence of 14 white sapotes wrapped in tomato wrappers and also a considerable quantity of loose paper between the sapotes and the sour limes. The entire package containing the limes and sapotes was seized and destroyed. The importer disclaimed any knowledge of the prohibited fruit in this package and, upon request, instructed his shippers in Cuba to discontinue the forwarding of prohibited fruits.

Entomological interceptions of interest.--Two living larvae of the trypetid *Anastrepha nombinpraeoptans* Sein were intercepted at San Juan, P. R., on August 24, 1939, in *Spondias* sp. in baggage from St. Thomas, American Virgin Islands. Adults of *Bruchus loti* Payk. were found at Mobile, Ala., on December 12, 1938, in rye-straw jackets contaminated with vetch in cargo from France. A living specimen of the lygaeid *Ligyrocoris nitidicollis* (Stal) was taken at Laredo, Tex., on November 1, 1939, on a marigold in baggage from Mexico. A living adult of the weevil *Calendra phoeniciensis* (Chittn.) arrived at El Paso, Tex., on November 2, 1939, on a mustard leaf in cargo from Mexico. Living specimens of the turnip gall weevil (*Ceutorhynchus pleurostigma* Marsh.) were taken at Houston, Tex., on July 29, 1939, in turnips in ship's stores from Sweden. Living specimens of the scale insect *Lepidosaphes chinensis* Chamberlin were intercepted at San Francisco, on November 6, 1939, on *Pandanus* sp. in the mail from China. A living adult of the platypodid *Tesserocerus dejeani* Chapuis arrived at New Orleans on July 27, 1939, in a primavera (*Tabebuia donnell-smithii*) log in cargo from Honduras. A living adult of the bostrichid *Micrapata scabrata* (Er.) was found at Washington, D. C., on October 9, 1939, with corn on the cob in the mail from Peru. Living specimens of the mite *Eriophyes plucheae* Cook were taken at Boston on April 18, 1939, on leaves of *Pluchea odorata* in the mail from Barbados. A living adult of the bruchid *Acanthoscelides dominicanus* (Jak.) was intercepted at New York on November 3, 1939, in seed of divi-divi (*Caesalpinia coriaria*) in cargo from Nicaragua.

Pathological interceptions of interest.--A Chinese pomelo bearing several lesions of citrus canker (*Bacterium citri* (Hasse) Doidge) was incepted in baggage on December 28 at Blaine. A rust found on leaves of *Polypodium plesiosorum* from Mexico and sent in from Brownsville on November 2 has been doubtfully determined as *Milesia laeviuscula* (Diet. & Holw.) Faull. *Mycosphaerella citrullina* (C. O. Sm.) Gross. was intercepted at New York on January 3, on cucumbers in cargo from Cuba, on January 16 on muskmelon in stores from Venezuela, and on January 25 on one hairy squash of a crate in cargo from Cuba. *Phyllachora cynodontis* (Sacc.) Niessl. was found at New York on January 15 on *Cynodon dactylon* from India carried for use as bedding in an animal cage. *Phyllosticta antirrhini* Syd. was found on leaves of snapdragons from Cuba on January 25 at New York. During

January thousands of lugs of tomatoes were imported from Cuba through the Port of New York and inspection showed scattering specimens of rot determined as Phytophthora terrestris Sherb. A few specimens of the Rhizoctonia bataticola (Taub.) Butler rot of melons from Chile were found at New York in shipments received the latter part of January. Septoria endiviae Thuem. was found on escarole leaves in stores from Italy on January 13 at New York. The rust Uromyces striatus medicaginis (Pass.) Arth. was found on leaves of alfalfa hay from Argentina on December 31, at New York.

DOMESTIC PLANT QUARANTINES

Grasshopper and Mormon cricket control projects consolidated at Denver.--The field headquarters office of Mormon cricket control, formerly located at Salt Lake City, was moved to Denver on February 1 and combined with the field headquarters office for grasshopper control, with offices at 820 Insurance Exchange Building, 810 14th Street. The projects are under the general direction of B. M. Gaddis, of this Division, with Claude Wakeland continuing as field director of both projects. R. A. Roberts, project leader on Mormon cricket control in 1939, is assistant project leader of the combined activities. The character of control operations and the overlapping of the area infested by these two pests have made the consolidation of the work advantageous from an administrative standpoint.

Grasshopper and Mormon cricket control workers hold conference.--For the purpose of establishing broad fundamental policies under which the control of grasshoppers and Mormon crickets may be carried out under cooperative programs in the current year, Lee A. Strong called a conference of Bureau workers, commissioners of agriculture, extension workers, and other representatives of the various infested States, at Denver on January 9 and 10. A plan of operation presented by B. M. Gaddis outlined the general principles under which any control operations might be conducted in the crop year of 1940. This plan further provides for subsequent meetings in each State having an important grasshopper problem, in order to formulate a memorandum of understanding of the details of operation for the State concerned. Reports of the results of the 1939 campaigns against the 'hoppers and crickets were presented by leaders of these respective projects, and the power machine recently designed by the Bureau for spreading grasshopper bait, and the construction plans of which are being prepared, was demonstrated. Eighteen States were represented at the conference.

Indians and C. C. C. boys help control Mormon crickets.--Indians at 11 agencies helped materially last season in dusting, spreading bait, and erecting barriers against Mormon cricket advances. This work, together with the equipment and dusters supplied by the Indian Service, is valued at over $13,000. Boys in C. C. C. camps of the Division of Grazing of the Department of the Interior, of the Forest Service, and of the Soil Conservation Service, did similar work, and these agencies also furnished trucks, storage, camp equipment, and other supplies. The total contributions from all these Federal sources amounted to over $32,900.

Contributions to Mormon cricket control by various agencies.--In reducing to a percentage basis the contributions made to Mormon cricket control in 1939, it is found that the total contribution by the Bureau was

69.7 percent, a figure slightly above the 66 2/3 percent goal which we have tried to maintain during the last 2 years. The remaining percentage was provided by States, counties, individuals, and other agencies.

The peach mosaic situation in California.--All mosaic trees have been removed, up to January 27, from approximately 85 percent of all the properties in California on which the disease is known to exist. Of the diseased trees found, 75 percent have been removed. All known infected trees have been removed with the owner's approval in the counties of Imperial, Los Angeles, Orange, and San Diego.

Phony peach quarantines may be lifted from 2 entire States and 24 counties in other States.--No phony peach disease having been found in the last 3 years in Indiana or Pennsylvania, nor in 24 formerly infected counties in Illinois, Kentucky, Missouri, and North Carolina, notices have been sent to pest-control officials of peach-growing States that the designated States and counties are eligible for release from standard quarantines. While a substantial number of counties in the more heavily infected States have also been found free from the disease for 3 years, it is not considered advisable as yet to release them from quarantine.

January work on the peach disease project.--The removal of phony trees in Georgia and of mosaic trees in California and New Mexico went forward in January, and abandoned trees were taken out in Alabama, Arkansas, Colorado, South Carolina, Tennessee, Texas, and Utah. Over 2,000 mosaic trees in California were removed during the month. In Georgia 7 additional counties were practically cleared of phony trees. The relief laborers averaged 577. State and county participation was represented by 3 field supervisory employees each in Alabama and Georgia, 1 in Colorado, and 1 office worker in each of the States of Alabama and Georgia.

Land-clearing for control of white-fringed beetle.--Joint Federal-State W. P. A. projects have recently been approved in Louisiana and Alabama, and crews of laborers are now clearing land of brush and debris in order to place the ground in satisfactory condition for the application, during the active control season, of herbicides and insecticides.

Property owners cooperate in white-fringed beetle control program.--Throughout the areas infested with the white-fringed beetle, contacts have been made with property owners for the purpose of developing cropping programs with farmers so that the most effective type of control may be conducted. Many owners of heavily infested fields have modified their farm practices and released the land to the project so that clean-cultivation methods may be applied. In many cases these releases cover a period of 2 years. Detailed programs as applied to each infested area are being worked out with the assistance of cooperating State officials.

White-fringed beetle certification requirements temporarily lifted for potatoes and sweetpotatoes.--Soil-free potatoes may be shipped until May 1, 1940, without certification under the white-fringed beetle quarantine, from any part of the regulated area, and soil-free sweetpotatoes may be so shipped without the certificate until June 1, 1940. The above modification was authorized in a revision, on February 2, 1940, of circular B. E. P. Q. 485. The restrictions on soil, earth, sand, clay, peat, compost, and manure, remain in effect throughout the year when shipped interstate from any part of the regulated area.

Progress in sweetpotato weevil eradication.--The low temperatures which prevailed during the latter half of January throughout the areas in which sweetpotato weevil eradication activities are conducted in Georgia, Mississippi, Alabama, and Texas caused such wide destruction of remaining host material, which had been plowed up in the fields for this purpose, that it is believed the weevil population has also been reduced. During the month host material was destroyed by State-sponsored W. P. A. units in Alabama, both on the mainland and on islands where wild host plants are prevalent. Such work also went forward in Thomas County, Ga., and in eradication and control areas in Mississippi. Bureau inspectors carried on inspection, eradication, regulatory, and educational activities. They inspected over 500 properties in January and found 18 new infestations. An inspector of the Georgia Department of Agriculture, at the invitation of the county agent of Thomas County, Ga., discussed the sweetpotato weevil eradication project over radio station WPAX on January 27.

Gregg County, Tex., released from sweetpotato weevil quarantine.--Inspections in Gregg County, Tex., in areas previously infested, and in the vicinity of such areas, have failed to show a sweetpotato weevil infestation in the last 12 months. All properties in the county, we are informed, have accordingly been released from quarantine, and owners cautioned to maintain sanitation conditions and take such precautions as are necessary to prevent reinfestation.

Citrus canker work in Texas and Louisiana.--Following the policy of the last several seasons, the Bureau inspectors on citrus canker work were assigned to activities in Texas during the fall and winter, and at the close of January they again took up the work in Louisiana, jointly with 3 State inspectors. During the month the force of 9 Bureau inspectors, 1 Texas inspector, and 100 relief employees worked 17 old infected properties in Galveston and Brazoria Counties, Tex., and found 11 of them are apparently remaining free from citrus seedlings. On 6 of the properties, 48 escaped *Citrus trifoliata* seedlings were found and destroyed. Over 2,000 other properties in the noncommercial area of Texas were also inspected, and over 16,000 abandoned citrus trees were destroyed. The severe cold of the month appears to have greatly damaged if not destroyed citrus trees, other than the *trifoliata* species, in the vicinity of Houston.

Transit inspectors meet in Washington.--A conference of transit inspectors from New York, Pittsburgh, Boston, Philadelphia, Springfield (Mass.), Jacksonville, and Chicago was held at Washington on January 29-30 and resulted in a more comprehensive idea on the part of the more recently assigned men of the nation-wide aspect of the project. Of special importance was the plan to effect closer coordination of activities between the stations and regions to avoid duplication of inspection, thereby enabling inspectors at each station to concentrate on trains and shipments that would not be seen at any other point.

Transit-inspection activities in midwinter.--Narrative reports for the month of January include the statement that Philadelphia inspectors in the year 1939 conducted inspection at 19 points in the area of that city. Of the 92,000 shipments inspected by 3 inspectors at those points, 242 violations were found. The Atlanta inspector reported that the record-breaking snowfall and extreme cold in January so affected the nursery-stock shipping that even the rose nurseries in Texas curtailed their shipments to Florida and other southern points. At Pittsburgh the inspector took advantage of the usual lull in nursery-stock shipping in January and made a study of the inspection tours for possible improvement, and also renewed contacts with agents of carriers in the interest of spreading quarantine information. The Boston men reported a persistence on the part of some shippers in the practice of erroneously labeling their shipments with such statements as "No inspection required--greenhouse-grown only" in the case of woody plants restricted under the gypsy moth quarantine, as well as cable reels bearing the labeling "No inspection necessary--at all times inside of building."

Survey for Egyptian alfalfa weevil.--Field activities relating to the new species of alfalfa weevil in Yuma County, Ariz., were begun in December with 4 inspectors, the force to be increased early in the spring, when it is expected that larvae will be abundant. The inspectors are working closely with a biologist of the Division of Cereal and Forage Insect Investigations, in order to learn all they can concerning the life history and habits of the weevil. During the survey specimens will be sent to the Yuma office, where a taxonomist will make the identifications. The work is being handled as a separate project under the supervision of H. T. Rainwater, formerly on grasshopper work. An office has been established at Yuma, in the First National Bank Building.

CONTROL INVESTIGATIONS

Pyrethrin in areosol form effective against adult mosquitoes.--W. N. Sullivan, E. R. McGovran, and J. H. Fales, of this Division, in cooperation with L. D. Goodhue, of the Division of Insecticide Investigations, report interesting results from a study of the effectiveness of the pyrethrins in areosol form against the adult mosquito (Culex sp.). In preliminary tests, about 500 adult mosquitoes from 2 to 3 days old were placed in wire-screened cages within a 1,100-cubic foot room and subjected for 10 minutes to the smoke or fog produced by spraying an alcoholic solution of the pyrethrins on a hot plate (temperature 375° C.). For this work 20 cc. of solution containing 5 mg. of pyrethrins per cc. of ethyl alcohol was used. Carbondioxide pressure was used in the atomization to reduce possibility of fire hazard and to prevent the formation of aldehydes. All mosquitoes subjected to this treatment were "knocked-down" within a 5-minute period and none again attained normalcy. In 48 hours after treatment 99 percent of the treated mosquitoes were dead. The untreated check showed a mortality of 1 percent over the same period. In many respects the pyrethrins in areosol form have excellent properties for use in prevention of the conveyance with aircraft of living tropical mosquitoes and possible transmission of yellow fever to susceptible but uninfected areas. However, since only Culex sp. was used in this test and a 10-percent sugar solution was the only food supplied the adults, it is felt this test should be repeated, using blood-fed mosquitoes of Aedes and Anopheles sp. before any definite conclusions are drawn as to the effectiveness of this material in this work.

INSECTICIDE INVESTIGATIONS

Chemical studies of devil's-shoestrings.--The occurrence of rotenone in the roots of *Tephrosia virginiana*, commonly known as the devil's-shoestrings, which is the most abundant species of *Tephrosia* indigenous to the United States, has stimulated interest in this insecticide-bearing plant. Except for the original work by E. P. Clark of this Division, which first revealed the presence of rotenone, little chemical work on the constituents of the root of this plant has been reported. L. D. Goodhue and H. L. Haller have been engaged on this problem recently, and will soon issue a paper describing their findings. They worked on freshly harvested and dried roots from plants selected from breeding experiments designed to increase the insecticidal value. The roots contained 7.4 percent of materials soluble in chloroform, of which about one-third proved to be rotenone. From the resinous portion of the extract, inactive deguelin was obtained, and finally there was also obtained an oil containing sesquiterpenes and glycerides. The forthcoming paper will give details concerning the various fractions into which the original extractives were divided.

Nornicotine found as predominating alkaloid in tobacco.--It has recently been found by L. N. Markwood that nornicotine occurs as a large part of the total alkaloid in a certain strain of *Nicotiana tabacum*, ordinary tobacco. This alkaloid, which is closely related to nicotine chemically and in biological action, has been found in other species of *Nicotiana*, and was previously known to occur also in *N. tabacum* in small amounts. The present finding, however, reveals that about 95 percent of the total alkaloid of this particular strain is nornicotine. Nornicotine at present is scarce, but efforts will be made to prepare a supply of it for insecticidal tests.

Analysis of commercial dihydrorotenone.--Dihydrorotenone is the only derivative of rotenone that retains the high insecticidal action of the parent compound. It is more stable than rotenone toward oxidation in the presence of light and, mainly because of this advantage, it is being produced commercially. On a commercial scale the catalytic hydrogenation of rotenone does not always proceed to give a quantitative yield of dihydrorotenone, but instead yields a group of nontoxic compounds comprising rotenonic acid, dihydrorotenonic acid, and dihydrorotenol. The amount of dihydrorotenone obtained is now being judged by the insecticidal effect as determined by the Peet-Grady method using houseflies. Messrs. Goodhue and Haller have examined the physical and chemical properties of dihydrorotenone and the other materials mentioned with the object of finding an easy method of determining the dihydrorotenone in the mixtures. They find that the Goodhue red-color test is given only by the desired compound, dihydrorotenone, and not by the other undesirable ones. This colorimetric method is therefore suggested as a means of determining dihydrorotenone in order to obviate the necessity of resorting to the more tedious biological test.

BEE CULTURE

Resistance of bees to American foulbrood probably not physiological.--A. W. Woodrow, of the Intermountain States Bee Culture Laboratory at Laramie, Wyo., reports that the brood from resistant and nonresistant colonies, used in the studies on resistance of bees to American foulbrood, became about equally infected when reared in heavily diseased colonies which provided a uniform heavy inoculation. There was no evidence of physiological resistance in the brood of any colony. Variations in the proportion of brood infected were closely related, however, to the age of the brood at the time it was first exposed to infection. The highest proportion of infection observed was 76.9 percent on one side of one comb. As the infectious material must be supplied the first day of larval life (see News Letter v. VI, No. 11, p. 31, Nov. 1, 1939), when the brood is being fed only larval food from the pharyngeal glands of the nurse bees, it appears unlikely that the larvae become infected through the feeding of infectious honey or pollen, except perhaps accidentally. It appears more likely that the disease organisms are introduced to the young larvae from the mouth parts of the nurse bees. If this is the case, the escape of a large proportion of the brood from infection is a result both of the short time it is open to infection and of the type of feeding at that time, rather than of physiological resistance.

Vapor pressure of sugar solutions varies with concentration.--Geo. H. Vansell, Davis, Calif., reports, in connection with his work on nectar secretion, the unexpected finding that "solutions below a certain level of concentration lost moisture, while those of greater concentration gained moisture. A series of sugar solutions obtained by diluting honey with distilled water were exposed in a humidifier at about 20° to 25° C. for 114 hours. Distilled water covered the bottom of the sealed humidifier and sheets of blotting paper hung into the water as wicks. The air was assumed to be saturated. The respective original and final concentrations were 38.0, 22.5, and 12.3, and 34.3, 22.9, and 14.9 percents. The two lesser concentrated solutions lost water, indicating that their vapor pressures might be higher than that of distilled water. The concentration in two drops of poinsettia nectar in this same time changed from 31- to 25-percent sugar. All samples were exposed in watch glasses floating on the water."

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Classification of male ants.--Male ants are often received for determination, but it is usually very difficult or impossible to identify them because the classification of ants is based primarily on the wholly different worker caste. Some fundamental taxonomic work on the males has been badly needed, and M. R. Smith has undertaken such a study in the hope of developing a generic classification of the males. This study is greatly hindered, however, by the lack of male specimens that can be positively identified through association with workers taken from the same colonies. It is hoped, therefore, that where such association can be definitely established in the field and specimens of the males and workers can be collected conveniently, these will be submitted to the Division of Insect Identification, preferably in alcohol, in order to further Mr. Smith's study.

High parasitization of certain leafhoppers.--Specimens of empoascan leafhoppers used in experiments in transmission of peach mosaic disease at Brownwood, Tex., and submitted for determination by L. S. Jones, proved to be of especial interest because of the high percentage of parasitization by a species of Dryinidae. The leafhopper material consists of 708 specimens used in 20 tests. The percentage of parasitization for the entire lot is 56.2, although material used in certain tests showed as high as 84 percent.

Change of names in the Homoptera.--For a number of years there has been a conspicuous lack of uniformity in the choice of names for certain groups of the sternorhynchous Homoptera. The question of the proper application disposition of the generic names *Chermes*, *Adelges*, *Psylla*, and *Psyllia* has been reviewed and the essential facts are as follows:

Chermes Linnaeus, 1758, has as its type *Chermes abietis* L.

Adelges Vallot, 1836, is monobasic, the type being *A. laricis* Vallot, 1836, which is a synonym of *Chermes abietes* L. *Adelges* Vallot, 1836, is therefore an absolute synonym of *Chermes* Linnaeus, 1758.

Psylla Geoffroy, 1762, included no named species, Geoffroy's treatment being strictly binary, not binomial. The first type designation for *Psylla* was by Latreille, 1810, who named *alni* L. the type.

Psyllia Kirkaldy, 1905, was proposed as a new name for *Psylla* of authors, not Linnaeus, with type *pyri* L. According to the present generic concept, *Psyllia* Kirkaldy, 1905, is a synonym of *Psylla* Geoffroy, 1762.

The use of "Chermidae" for the family Psyllidae appears to be based on the erroneous belief that Lamark, 1801, had designated *ficus* as the type of *Chermes*. However, the International Commission on Zoological Nomenclature has definitely stated, in Opinion 79, that Lamark's "Système des Animaux sans vertèbres" is not to be accepted as designation of type species. The proper family name for the "jumping plant lice" is Psyllidae.

The genus *Chermes* belongs in the superfamily Aphioidea, and is the type genus of the family Chermidae Fallén, 1814. As the oldest available family name, Chermidae, will take precedence over Phylloxeridae Lichtenstein, 1885, as a family designation for the plant lice now known by the latter name. Both Cherminae and Phylloxerinae will, however, be used as subfamily names for the categories now known as Adelginae and Phylloxerinae, respectively.

Unusual number of species in packing material from abroad.--Fifty-three different species of insects have been identified among material intercepted by inspectors at the New York office of the Division of Foreign Plant Quarantines in forest-litter and sphagnum packing on the S. S. *Scanpenn* which arrived from Denmark on January 11. All specimens were alive when collected. Following is a record of the number of families in the various insect orders that were represented, with an indication of the number of species in each: Coleoptera, 10 families, 29 species; Lepidoptera (larvae), 4 families, 4 species; Orthoptera, 1 family, 1 species; Hymenoptera, 4 families, 5 species; Diptera (larvae), 2 families, 4 species; Homoptera, 2 families, 2 species; Heteroptera, 6 families, 8 species.

Addition to collection of coleopterous larvae.--A valuable sending of reared coleopterous larvae has been received from J. P. Kryger, Gentofte, Denmark. Of the 64 species which he sent, 16 are new to the larval collection.

---oOo---

UNIVERSITY OF FLORIDA
3 1262 09244 4628